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A.D. 1799 . . . . . N<sup>o</sup> 2302.

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S P E C I F I C A T I O N

OF

ROBERT DELAP.

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BOILERS FOR STEAM ENGINES, &c.

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L O N D O N :

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Boilers for Steam Engines, &c.

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DELAP'S SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, ROBERT DELAP, of Banville, near Banbridge, in the Kingdom of Ireland, send greeting.

WHEREAS His present Majesty King George the Third hath, by his  
5 Royal Letters Patent under the Great Seal of Great Britain, bearing date at  
Westminster, the Sixth day of April, been graciously pleased to give and grant  
unto me, the said Robert Delap, my executors, administrators, and assigns,  
His especial licence, full power, sole privilege and authority, to make, use,  
exercise, and vend, for and during the term of years therein mentioned, within  
10 England, Wales, and the Town of Berwick upon Tweed, and also in all His  
Majesty's Colonies and Plantations abroad, my Invention of "CERTAIN ŒCONO-  
MICAL BOILERS FOR SUNDRY USEFUL PURPOSES;" in which said Letters Patent  
there is contained a proviso obliging me, the said Robert Delap, to particularly  
describe and ascertain the nature of my said Invention, and in what manner  
15 the same is to be performed, by an instrument in writing my hand and  
seal, and cause the same to be inrolled in His said Majesty's High Court of  
Chancery within six calendar months after the date of the said recited Letters  
Patent, otherwise the said Letters Patent, and all liberties and advantages  
thereby granted, should utterly cease, determine, and be void, as in any by the  
20 said Letters Patent, reference being thereunto had, will more fully and at large  
appear.

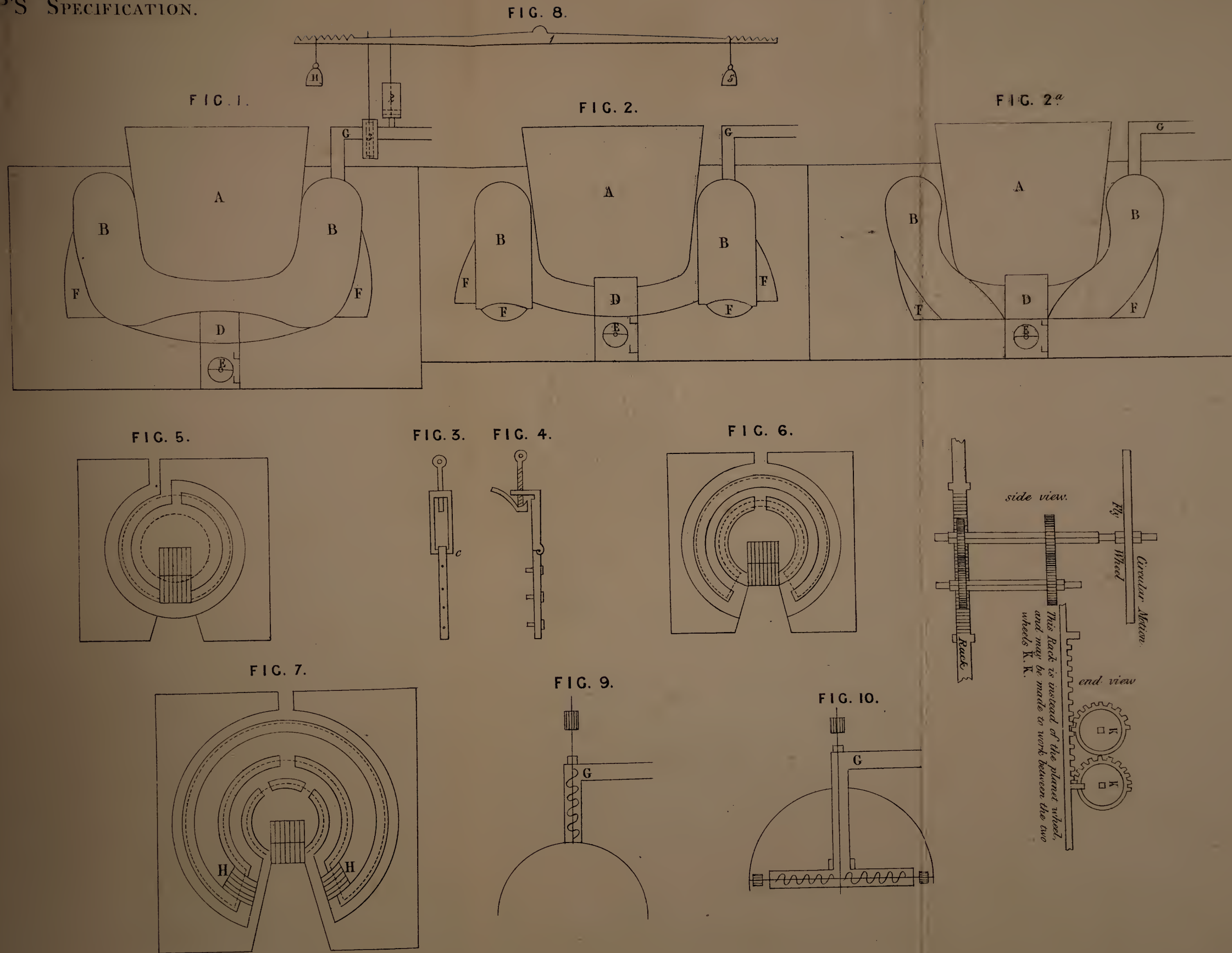


*Delap's Improvements in Boilers.*

**NOW KNOW YE**, that in compliance with the said proviso, I, the said Robert Delap, do hereby disclose, discover, and describe my said Inventions by the above Plans or Drawings, and the descriptions thereof hereunder written, that is to say:—

I call my boilers *œconomical*, because the fuel necessarily consumed in 5 the various operations of our manufactures is made at the same time to communicate sufficient heat to them, not merely by continuing the flues under and around them (as is common after the fire has performed its usual business), but direct and immediate in the first instance, in addition to those advantages. All the improvements hitherto made in respect to boilers consist 10 in a particular construction of the fire-place and flues with a view to save fuel; but yet they must all have fire applied exclusively to themselves to enable them to perform their work, and there is still an equal (if not greater) heat wasted upon the flues and surrounding work. The peculiar principle of my Invention is that that I avail myself of this hitherto wasted heat, and with it work my boilers, by 15 placing them in the situation of these flues and other work, and also in forming them so as to surround all fires, whether applied to other boilers or any other purpose, so that I may venture to say these boilers consume no fuel, and yet work as well and are as applicable to every useful purpose as any other boilers. Those who use fire for boilers of any description or for other purposes may, with 20 the same fuel they now consume, have a steam (or other) boiler on this principle and construction, which will work a steam engine or perform other processes as well as any boiler whatever. Those who have steam engines already by adopting these boilers may, with the same fire they now use, work their engines and other boilers or perform any other process to which fire is necessary; a few 25 examples of their application this way I shall give by the above Drawings and explanations, which will be sufficient to shew their principle and construction, and that the enormous expence of fuel to work steam engines will be entirely saved to bleachers, brewers, distillers, sugar refiners, dyers, &c. &c. &c., and not only to them but to any one who uses fire for other purposes. They 30 may also be used with equal advantage as open boilers. Fig. 1, 2, 2 *a*, A, A, A, sections of common boilers, such as are used for boiling cloth, brewing, &c. &c. &c.; B, B, B, B, B, B, sections of *œconomical* boilers, surrounding the common ones in such manner as to receive the full benefit of the fire in the first instance (their form may be varied to suit the situation) without in the 35 least diminishing the heat usually applied to the common boilers, and thus without any additional fuel on their account. They will produce steam of sufficient strength to work any steam engine. Any common boiler may be converted into a steam boiler by adding a cover, the boiler doing its usual work

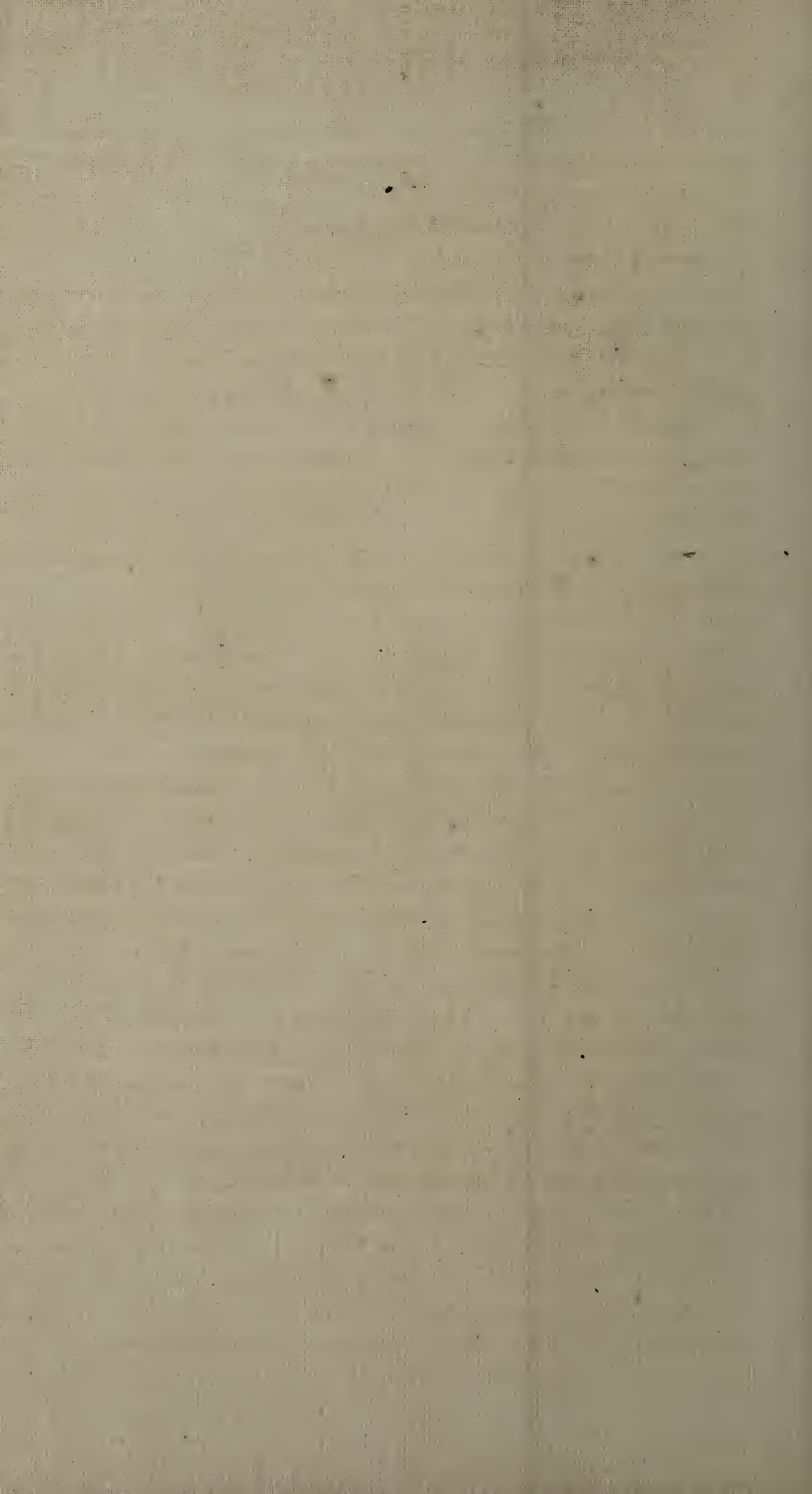
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DELAP'S SPECIFICATION.



The enrolled drawing is partly colored.

Malby & Sons. lith.





*Delap's Improvements in Boilers.*

at the same time. The boiler and cover are connected or detached expeditiously, as occasion requires, by the contrivance. Fig. 3, an iron stirrup, screw, and strap, with an hinge at C. The strap is screwed fast to the side of the boiler. The stirrup is turned up over a projecting point in the cover on which  
5 it is screwed down; there must be such number of these as will confine the steam. Or Fig. 4, an hinged strap, with the screw falling into the groove of a metal rim round the cover, instead of the above points; D, D, D, Fig. 1, 2, 2*a*, the fire-places, communicating in the first instance equal heat to the œconomical as to the common boilers; E, E, E, the ash pit, with registers; F, F, F, F, F,  
10 F, F, F, F, F, the winding flues passing under and encircling (or in metal pipes through) the œconomical boiler. G, G, G, pipes to convey the steam to the engine, as usual. Fig. 5, 6, the ground plan of these flues; their course is shewn by the unshaded part; the shaded parts shew the brick-work between and round these flues; the inner dotted circles on these flues shews the ground plan of the  
15 common boilers. The outter dotted circles shew that of the œconomical boilers. Should it be necessary for any one to have a larger steam engine than could be worked by the fire he has occasion for in his usual processes, he may (with a very small addition of fuel) obtain his object by having his flues constructed as in Fig. 7, and putting small fires in the grates H, H. When these boilers  
20 are used to work steam engines (as in the foregoing instances), the steam ought to issue at all times with equal force, for which purpose the regulator, Fig. 8, is added to the steam pipe. 1, the beam; 2, a cylinder open at top, but close at bottom (except the small tube which connects it with the main steam pipe); in the cylinder is a piston well packed; 3, a sliding valve, or  
25 cock, &c.; 4, 5, two weights to be used as occasion requires. It operates thus:—When steam in equilibrium with the atmosphere is wanted, both weights 4 and 5 are taken off; the beam is then a true balance, having the piston valve, &c. attached to it. The engine is set to work by pushing down the valve or turning the cock, &c. which opens the steam passage; the piston is  
30 at the same time brought near to the bottom of the cylinder; they will remain in this state while the steam is in equilibrium with the atmosphere; but the instant it becomes stronger the piston is raised, and with it the valve or cock, &c., and thereby the steam passage is contracted, and thus the equilibrium will be restored, of course an equal motion in the machinery preserved. If a  
35 stronger steam than the atmosphere is wanted, the weight 4 is put on, and the weight 5 off. If the reverse, the weight 5 is put on, and the weight 4 off. The valve or cock, &c. must be placed between the boiler and this cylinder. Another piece of œconomy effected by these boilers (when used for the production of steam) is saving of labour by the simple contrivance represented. Fig. 9,



*Delap's Improvements in Boilers.*

G, the main steam pipe (as described before), in which is an axis with a spiral flanche filling the pipe. The end of this axis passes through the bend of the pipe, and is there made steam-tight. On this end a pinion or pulley, &c. is put, which will work a shaft by a cog wheel or pulley, &c., and this may be applied to stir any ingredients in the common boiler to work a pump or any 5 other thing it is found equal to instead of manual labour, and the steam, after performing this, will work a steam engine. Fig. 10 is another contrivance for the same purpose. The steam pipe is here dropped perpendicular within the boiler, to which are attached one, two, or more horizontal hollow arms; in the ends of these arms are placed the above-described axis with spiral flanches, 10 the pinions acting upon a horizontal circle of cogs which is made fast to the inside of the boiler. An inspection of the Figure will shew its operation fully.

In witness whereof, I, the said Robert Delap, have hereunto set my hand and seal, this Eighth day of April, in the year of our Lord One 15 thousand seven hundred and ninety-nine.

ROBERT DELAP. (L.S.)

I. WILMOT.

AND BE IT REMEMBERED, that on the same Eighth day of April, in the year above mentioned, the aforesaid Robert Delap came before our Lord the King in His Chancery, and acknowledged the Specification aforesaid, 20 and all and everything therein contained, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute in that case made and provided.

Inrolled the Thirtieth day of July, in the year above written.

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